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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/798,662	03/11/2004	Hyun-Cheol Shin	5000-1-543	6299

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EXAMINER	
DIACOU, ARI M	
ART UNIT	**PAPER NUMBER**
3663	

DATE MAILED: 06/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/798,662	SHIN ET AL.	
	Examiner	Art Unit	
	Ari M. Diacou	3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 April 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. The arguments directed towards the patentability of the claims have been considered but are moot in view of the new grounds of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. The italicized clauses are essentially method limitations or statements or intended or desired use and are being examined as if the apparatus were capable of performing the functions described in said clauses. The applicant is claiming an apparatus, not a method or process. Thus, these claims as well as other statements of intended use do not serve to patentably distinguish the claimed structure over that of the reference. See In re Pearson, 181 USPQ 641; In re Yanush, 177 USPQ 705; In re Finsterwalder, 168 USPQ 530; In re Casey, 512 USPQ 235; In re Otto, 136 USPQ 458; Ex parte Masham, 2 USPQ 2nd 1647.

See MPEP § 2114 which states:

> A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from the prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ 2nd 1647
>
> Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than functions. In re Danly, 120 USPQ 528, 531.
>
> Apparatus claims cover what a device is not what a device does. Hewlett-Packard Co. v. Bausch & Lomb Inc., 15 USPQ2d 1525, 1528.

As set forth in MPEP § 2115, a recitation in a claim to the material or article worked upon does not serve to limit an apparatus claim.

6. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fenner (USP No. 3484713) in view of the Wikipedia article.

- Regarding claim 1, Fenner discloses a multi-wavelength light source comprising:
    - a substrate; [Fig. 1, #10] [Col. 2, line 48-53]
    - a laser laminated on a irst portion of the substrate wherein the laser is driven by a driving current below a predetermined threshold. [Fig. 1, #1] [Col. 2, lines 37-52] [Any laser is capable of this kind of operation, and suggested by Fenner in Col. 1, lines 49-65]
    - a semiconductor optical amplifier being laminated on a second portion of the substrate and having a first end surface, the first end surface being slanted and opposed to the side of the surface laser, [Fig. 1, #2] [Col. 3, lines 35-70]
    - *wherein the semiconductor optical amplifier means is adapted to reduce a relative intensity of noise in the plurality of channels of the multi-wavelength light and to amplify light output from the laser simultaneously.* [Fenner discusses ways to reduce noise in Col 3, line 35- Col 4, line 29]

but fails to disclose the multi-wavelength nature of the laser #1. The wikipedia reference teaches that when a laser is driven below threshold, the linewidth is orders of magnitude larger than when it is operated above threshold. Therefore, it would have been obvious to one skilled in the art (e.g. an optical engineer) at the time the invention was made, to operate the device of Fenner below threshold, for the advantage of increasing the linewidth of the output beam.

- Regarding claim 2, Fenner discloses the multi-wavelength light source as claimed in claim 1, wherein the laser comprises a fabry-perot laser, and the multi-wavelength light source further comprises:
    - a high reflection layer coated on a first end surface of the multi-wavelength light source, the first end surface of the multi-wavelength light source including a first end surface of the fabry-perot laser; and [Col. 2, line 66 – Col. 3, line 2]
    - anti-reflection layers being arranged on a side surface of the Fabry-Perot laser, the slanted surface of the semiconductor optical amplifier, and a second end surface of the multi-wavelength light source, [it is well known that to make a source incoherent, one removes the front reflector, see art pertaining to superluminescent light-emitting diodes]
    - wherein the second end surface of the multi-wavelength light source includes a second end surface of the semiconductor optical amplifier means, and [Fig. 1, #29]
    - wherein the side surface of the laser and the slanted surface of the semiconductor optical amplifier are opposed to each other. [Fig. 1, #19 and 30 are opposed to each other]
- Regarding claims 3 and 6, Fenner discloses the multi-wavelength light source as claimed in claim 1, wherein a band gap of the semiconductor optical amplifier means is smaller than that of the Fabry-Perot laser, so that a spectrum of the multi-wavelength light outputted from the Fabry-Perot laser coincides with a gain

spectrum that is amplified by the semiconductor optical amplifier. [Fenner discusses the desire to couple the amplifier to the laser in the 2nd paragraph of Col. 3, the examiner regards it as inherent to this aim that the amplifier have "a gain spectrum that is amplified by the semiconductor optical amplifier."]

- Regarding claim 4, Fenner discloses the multi-wavelength light source as claimed in claim 1, wherein the slanted surface of the semiconductor optical amplifier means opposed to the Fabry-Perot laser is inclined at a predetermined angle with respect to the side surface of the Fabry-Perot laser. [The examiner regards it as inherent that the slanting angle is predetermined, because there is no way known in the art to change the angle of a semiconductor feature after fabrication.]

7. Claims 7-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fenner (USP No. 3484713) in view of Fussgänger (USP No. 5202780) and Nakamura (USP No. 5394261).

- Regarding claim 7, Fenner discloses the details of the light source as claimed in the first two paragraphs of the amended claim 7 of the instant application, but fails to disclose the particulars of the surrounding WDM system. Nakamura
    - a branching device [3] for branching the multi-wavelength light into a plurality of downstream channels having the "common wavelength components" so as to output the downstream channels;

But fails to disclose the rest of the WDM network as well as the use of multiple frequencies in the transmitter used at the central office/center. Fussgänger teaches:

- a first multiplexer/demultiplexer for demultiplexing an upstream optical signal outputted from the remote node into a plurality of upstream channels having different wavelengths, and multiplexing the downstream channels into a downstream optical signal so as to output the multiplexed optical signal to the remote node; and [Fig. 1, #13]
- a plurality of photodetectors for detecting the upstream channels demultiplexed by the first multiplexer/demultiplexer. [Fig. 1, #12]
- Fussgänger also teaches Wavelength Division Multiplexing was used as a communications mechanism at the time of Nakamura's invention, and that wavelength division demultiplexers were available.

Therefore, it would have been obvious to one skilled in the art (e.g. an optical engineer) at the time the invention was made, to replace the Nakamura's LD [2] with the multi-wavelength source of Fenner and place that modified transmitter into Fussgänger's device in position [12] (to replace the 8 E/O devices), for the advantage of gaining the bandwidth advantages of WDM and the control advantages of external modulation such as lower bit error rate as discussed in columns 1 and 2 of Nakamura.

- Regarding claim 8, Fenner further discloses the laser of the light source section including a Fabry-Perot laser. [Col. 3, line 1]

- Regarding claim 10, Fussgänger further discloses:
    - the remote node including a second multiplexer/demultiplexer for multiplexing a plurality of upstream channels having different wavelengths, which are output from the subscribers, into an upstream optical signal so as to output the multiplexed optical signal to the central office, and demultiplexing the downstream optical signal output from the central office into a plurality of downstream channels so as to output the demultiplexed downstream channels to a corresponding subscriber. [Fig. 1, #25]
- Regarding claim 11, Fussgänger further discloses wherein each subscriber comprises:
    - a photodetector for detecting a corresponding downstream channel; [Fig. 1, # UA_n]
    - a light source for outputting the upstream channel to the remote node; and [Fig. 1, # UB_n]
    - a wavelength selection coupler for outputting the downstream channel to the photodetector, and outputting the upstream channel generated by the light source to the remote node. [Fig. 1, #25]
- Regarding claim 9, The multi-wavelength light source as claimed in claim 7, wherein the central office further comprises:
    - Nakamura discloses: a plurality of modulators for modulating the downstream channels demodulated by the demultiplexer; and [41-43]

- Fussgänger discloses: a plurality of wavelength selection couplers located between each of the modulators and the first multiplexer/demultiplexer, for outputting the downstream channels that are output from the modulators to the first multiplexer/demultiplexer, and for outputting the upstream channels, which are outputted from the first multiplexer/demultiplexer, to a corresponding photodetector. [#13, the 8 O/E outputs (←)]

Conclusion

8. While patent drawings are not drawn to scale, relationships clearly shown in the drawings of a reference patent cannot be disregarded in determining the patentability of claims. See In re Mraz, 59 CCPA 866, 455 F.2d 1069, 173 USPQ 25 (1972).

9. The references made herein are done so for the convenience of the applicant. They are in no way intended to be limiting. The prior art should be considered in its entirety.

10. The prior art which is cited but not relied upon is considered pertinent to applicant's disclosure.

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ari M. Diacou whose telephone number is (571) 272-5591. The examiner can normally be reached on Monday - Friday, 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on (571) 272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AMD 6/16/2006

JACK KEITH
SUPERVISORY PATENT EXAMINER